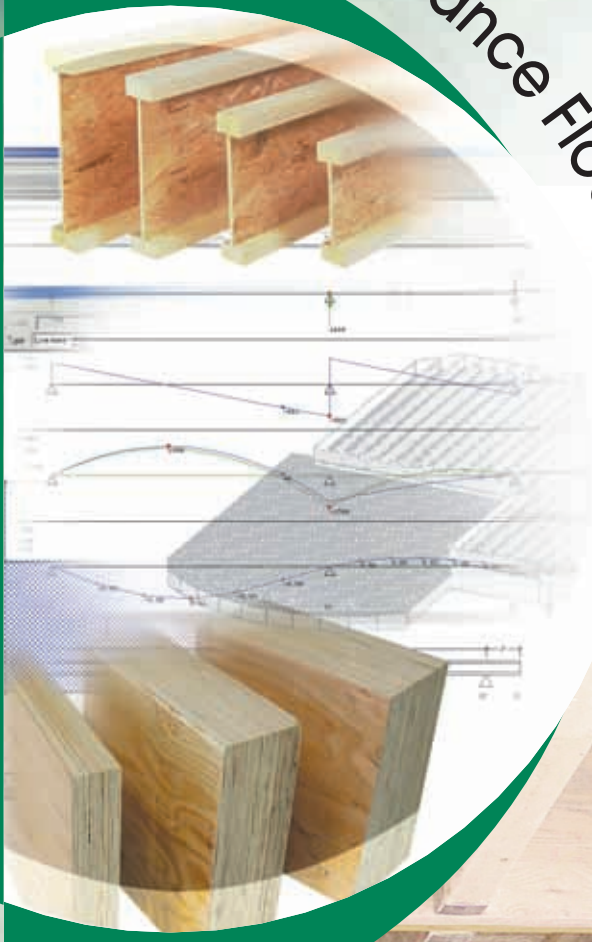
VERSA-LAM® 2.0E

High Performance Floor & Roof Systems



SPECIFIER GUIDE EASTERN CANADA

BOISE®

LIMIT STATES DESIGN

3rd Edition Canada

Work. Build. Create.

Introduction to VERSA-LAM® Products

When you specify VERSA-LAM® laminated veneer headers/beams, you are building quality into your design. They are excellent as floor and roof framing supports or as headers for doors, windows and garage doors and columns.

Because they have no camber, VERSA-LAM® products provide flatter, quieter floors and consequently, the builder can expect happier customers with significantly fewer call backs.

VERSA-LAM® 3100 2.0E Beam Architectural Specifications

This work includes the complete furnishing and installation of all beams as shown on the drawings, herein special and necessary to complete the work.

Materials: Southern Pine or Eucalyptus, laminated in a press with all grain parallel with the length of the member. Glue used in lamination is phenol formaldehyde exterior-type adhesive which comply with CSA O112.7.

Design: The beams shall be sized and detailed to fit the dimensions and loads indicated on the plans. All designs are in accordance with allowable values developed with ASTM D5456 and CSA O86-01 and listed in the Canadian Construction Materials Center CCMC 12472-R report and section properties based upon standard engineering principles. Verification of design of the beams by complete calculations shall be available upon request.

Drawings: Additional drawings showing layout and detail necessary for determining fit and placement in the buildings are (are not) to be provided by supplier.

Fabrication: The beams shall be manufactured in a plant evaluated for fabrication by the CCMC under the supervision of a third party inspection agency listed by the CCMC.

Storage and Installation: The beams, if stored prior to erection, shall be stored on stickers spaced a maximum of 15 ft. apart. Beams shall be stored on a dry, level surface and protected from the weather. They shall be handled with care so they are not damaged.

Installation: The beams are to be installed in accordance with the plans and Boise's Installation Guide. Temporary construction loads which cause stresses beyond design limits are not permitted. Erection bracing shall be provided to assure adequate lateral support for the individual beams and the entire system until the sheathing material has been applied.

Codes: The design shall be based on CSA O86-01 "Engineering Design in Wood" and the National Building Code of Canada.

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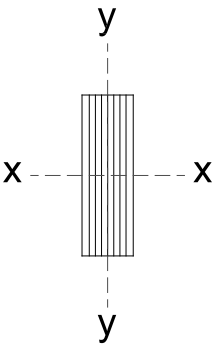
VERSA-LAM® 3100 2.0E Beam Characteristics

- No camber
- Dimensional stability
- Light and easy to handle
- Standard width of 1 3/4"
- Maximum lengths of 66 feet
- Depths matching AJS/BCI® joists
- Mechanical properties and design values guaranteed for a maximum use
- Easy gluing and nailing
- Superior load capacities
- Longer spans
- Lifetime guaranty

Evaluation Report: CCMC 12472-R

VERSA-LAM® 3100 2.0E Design Properties

Grade	Beam Size	Factored Bending Resistance, Mr (lb/ft)	Factored Shear Resistance, Vr (lbs)	Stiffness, EI ($x10^6$ lb/in^2)	Weight (plf)
VERSA-LAM® 3100 2.0E	1 3/4" x 7 1/4"	7,624	4,415	111	3.7
	1 3/4" x 9 1/4"	12,080	5,633	231	4.7
	1 3/4" x 9 1/2"	12,704	5,786	250	4.8
	1 3/4" x 11 1/4"	17,484	6,851	415	5.7
	1 3/4" x 11 7/8"	19,364	7,232	488	6.0
	1 3/4" x 14"	26,426	8,526	800	7.1
	1 3/4" x 16"	34,007	9,744	1,195	8.1
	1 3/4" x 18"	42,481	10,962	1,701	9.1



Design Properties (1)	VERSA-LAM® Beams	VERSA-LAM® Columns
Grade:	3100 2.0E	2650 1.7E
Modulus-of-Elasticity ($x10^6$ psi)	2.0	1.7
Specified Bending Strength, f_b (psi) (2)	6,270 (3)	4,900 (4)
Specified Shear Strength, f_v (psi) (5)	580	300 (6)
Specified Tension Strenght, f_t (psi) (7)	3,930	3,200
Specified Compression Parallel-to-Grain Strength, f_c (psi)	5,300	4,400
Specified Compression Perp-to-Grain Strength, f_{cp} (psi) (8)	1,525	1,525
Equivalent Specific Gravity for Fastener Design (9)	0.5	0.5

(1) As specified in CSA O86-01 Engineering Design in Wood
(2) Specified Bending Strength shall be multiplied by a size factor, $K_{Zb} = (12/d)^{(1/9)}$, where d in member depth [inches]
(3) Bending Strength in the strong axis, parallel to glue-line
(4) Bending Strength in the weak axis, perpendicular to glue-line
(5) Shear stress applied parallel to the glue-line
(6) Shear stress applied perpendicular to the glue-line. Shear stress applied parallel to the glue-line is 580 psi
(7) Specified Tension Strength shall be multiplied by a size factor, $K_{Zt} = (4/L)^{(1/8)}$, where L in member length [feet]
(8) Stress applied parallel to glue-line
(9) Fasteners installed perpendicular to glue-line

General Design Notes (Applicable to Entire Document):

- The Factored Resistances and Design Properties are calculated in accordance with CSA O86-01 "Engineering Design in Wood ".
- Design properties are limited to dry service conditions with, $K_S = 1.0$.
- "Standard term" load duration factor, $K_D = 1.0$, applied, as per Clause 4.3.2. in CSA O86-01.
- Lateral support is required at bearing points and along the compression edge of beam at intervals of 24" o.c. or closer.
- 1 3/4" members deeper than 14" are recommended to be used as multiple-member beams only.

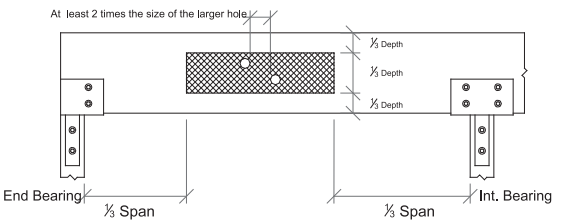
Use of span tables for commercial projects
All projects related to the application field of part 4 of the National Building Code (NBCC) shall take into consideration the effects of concentrated loads, as stipulated in article 4.1.6.3. When a project corresponds to the application field of part 4, the designer shall verity the effect of a concentrated load on the joists used. The NBCC has a table in section 4.1.6.10 of concentrated loads which shall be used according to the anticipated use of the floor. Given that possibilities are numerous, the span tables listed in this book do not take into consideration the effects of concentrated loads.

Allowable Holes

- Square and rectangular holes are not permitted.
- Round holes may be drilled or cut with a hole saw anywhere within the shaded area of the beam.
- The horizontal distance between adjacent holes must be at least two times the size of the larger hole. This restriction also applies to the location of access holes relative to bolt holes in multi-ply beams.
- Do not drill more than three access holes in any four feet long section of beam.
- These limitations apply to holes drilled for plumbing or wiring access only. The size and location of holes drilled for fasteners are under the regulations of the CSA O86-01 Engineering Design in Wood.
- Beams deflect under load. Size holes to provide clearance where required.
- This hole chart is valid for beams supporting uniform load only. For beams supporting concentrated loads or for beams with larger holes, contact Boise Cascade's Engineering Department.

- The maximum round hole diameter permitted is:

Beam Depth	Maximum Round Hole
5 1/2"	3/4"
7 1/4"	1"
Greater than 7 1/4"	2"



Allowable Uniform Loads

Key to table : Unfactored Live Load for L / 360 [plf]
Unfactored Total Load for L / 240 [plf]
Factored Total Load, Wf [plf]
Bearing Lengths [End / Intermediate] [in]

VERSA-LAM® 3100 2.0E
Allowable Uniform Load (lbs / ft)

Design Span (ft)	Beam Thickness / Beam Depth	7.25"	9.25"	9.5"	11.25"	11.875"	14"	16"	18"
6' - 0"	Unfactored Live Load for L / 360 [plf]	762	-	-	-	-	-	-	-
	Unfactored Total Load for L / 240 [plf]	-	-	-	-	-	-	-	-
	Factored Total Load, Wf [plf]	1,399	1,885	1,950	2,429	2,613	3,292	4,023	4,862
	Bearing Lengths [End / Intermediate] [in]	2 / 5	2.75 / 6.75	2.75 / 7	3.5 / 8.75	3.75 / 9.25	4.75 / 11.75	5.75 / 14.25	7 / 17.25
8' - 0"	Unfactored Live Load for L / 360 [plf]	321	667	723	-	-	-	-	-
	Unfactored Total Load for L / 240 [plf]	478	-	-	-	-	-	-	-
	Factored Total Load, Wf [plf]	948	1,326	1,369	1,680	1,796	2,216	2,648	3,122
	Bearing Lengths [End / Intermediate] [in]	2 / 4.5	2.5 / 6.25	2.75 / 6.5	3.25 / 8	3.5 / 8.5	4.25 / 10.5	5 / 12.5	6 / 14.75
10' - 0"	Unfactored Live Load for L / 360 [plf]	164	341	370	615	723	-	-	-
	Unfactored Total Load for L / 240 [plf]	243	508	551	-	-	-	-	-
	Factored Total Load, Wf [plf]	605	960	1,010	1,283	1,368	1,669	1,972	2,297
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.75	2.5 / 5.75	2.5 / 6	3.25 / 7.75	3.25 / 8.25	4 / 10	4.75 / 11.75	5.5 / 13.5
12' - 0"	Unfactored Live Load for L / 360 [plf]	95	197	214	356	418	686	1,024	-
	Unfactored Total Load for L / 240 [plf]	139	292	317	528	622	-	-	-
	Factored Total Load, Wf [plf]	419	665	700	964	1,068	1,338	1,570	1,816
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	2 / 4.75	2 / 5	2.75 / 7	3.25 / 7.75	4 / 9.5	4.5 / 11.25	5.25 / 13
14' - 0"	Unfactored Live Load for L / 360 [plf]	59	124	134	224	263	432	644	918
	Unfactored Total Load for L / 240 [plf]	86	182	197	330	389	641	-	-
	Factored Total Load, Wf [plf]	306	487	512	707	783	1,070	1,304	1,501
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.75 / 4	1.75 / 4.25	2.5 / 6	2.75 / 6.5	3.75 / 9	4.5 / 10.75	5 / 12.5
16' - 0"	Unfactored Live Load for L / 360 [plf]	40	83	90	150	176	289	432	615
	Unfactored Total Load for L / 240 [plf]	56	120	131	219	259	427	640	-
	Factored Total Load, Wf [plf]	233	372	391	539	598	817	1,053	1,279
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.75	2.25 / 5.25	2.25 / 5.75	3.25 / 7.75	4 / 10	5 / 12
18' - 0"	Unfactored Live Load for L / 360 [plf]	28	58	63	105	124	203	303	432
	Unfactored Total Load for L / 240 [plf]	38	83	90	152	180	298	447	639
	Factored Total Load, Wf [plf]	183	292	308	425	471	644	830	1,038
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	2 / 4.5	2 / 5	2.75 / 7	3.75 / 9	4.5 / 11
20' - 0"	Unfactored Live Load for L / 360 [plf]	20	42	46	76	90	148	221	314
	Unfactored Total Load for L / 240 [plf]	27	59	64	109	129	215	324	463
	Factored Total Load, Wf [plf]	148	236	248	343	380	520	670	838
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.75 / 4.25	2 / 4.5	2.5 / 6.25	3.25 / 8	4 / 10
22' - 0"	Unfactored Live Load for L / 360 [plf]	15	32	34	57	67	111	166	236
	Unfactored Total Load for L / 240 [plf]	19	43	47	81	96	160	241	346
	Factored Total Load, Wf [plf]	121	194	204	282	313	428	552	691
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.75	1.75 / 4.25	2.25 / 5.75	3 / 7.25	3.75 / 9
24' - 0"	Unfactored Live Load for L / 360 [plf]	11	24	26	44	52	85	127	182
	Unfactored Total Load for L / 240 [plf]	14	32	35	61	72	121	184	264
	Factored Total Load, Wf [plf]	101	162	170	236	261	358	462	579
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.75	2.25 / 5.25	2.75 / 6.75	3.5 / 8.25
26' - 0"	Unfactored Live Load for L / 360 [plf]	9	19	21	34	41	67	100	143
	Unfactored Total Load for L / 240 [plf]	10	24	27	47	56	94	143	206
	Factored Total Load, Wf [plf]	85	137	144	200	222	304	392	492
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	2 / 4.75	2.5 / 6	3 / 7.5
28' - 0"	Unfactored Live Load for L / 360 [plf]	7	15	16	28	32	53	80	114
	Unfactored Total Load for L / 240 [plf]	7	18	20	36	43	74	113	163
	Factored Total Load, Wf [plf]	73	117	123	171	190	261	337	422
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.75 / 4.5	2.25 / 5.75	3 / 7
30' - 0"	Unfactored Live Load for L / 360 [plf]	6	12	13	22	26	43	65	93
	Unfactored Total Load for L / 240 [plf]	5	14	16	28	34	59	90	131
	Factored Total Load, Wf [plf]	63	101	107	148	165	226	292	366
	Bearing Lengths [End / Intermediate] [in]	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.5 / 3.5	1.75 / 4	2.25 / 5.25	2.75 / 6.5

- Total Factored Load values are limited by shear or moment. Total Load values are the capacity of the beam in addition to its own weight.
- Unfactored Live Load values are limited by deflection equal to L / 360. For deflection limited to L / 480, multiply live load value by 0.75 (recommended for less vibrations).
- All 3 loading cases must be checked.Where a Live Load value is not shown, the Factored Total Load value will control.
- Table values represent the most restrictive of simple or continuous span beams applications and assume an uniform loading. Span is measured center to center of the supports. Analyze continuous span beams with the WoodWorks Sizer for Boise Cascade software if the length of any span is less than half the length of an adjacent span.
- Table values assume that lateral support is provided at each support and continuously along the compression edge of the beam.
- Table values for Minimum Required Bearing Lengths are based on the allowable compression design value perpendicular to grain for the beam and the Total Factored Load value shown. Other design considerations, such as a weaker support material, may warrant longer bearing lengths. Table values assume that support is provided across the full width of the beam.
- For 2-ply, 3-ply or 4-ply beams; double, triple or quadruple Allowable Factored Total Load and Allowable Unfactored Live and Total Load values. Minimum Required Bearing Lengths remain the same for any number of plies.
- 1 3/4" members deeper than 14" are recommended to be used as multiple-member beams. See details for proper connection.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the WoodWorks Sizer for Boise Cascade software.
- Live Load Values in Yellow gives a Live Deflection between 3/4" and 1".
- Live Load Values in Green gives a Live Deflection between 1/2" and 3/4".

Example:

The 3 loading cases must be checked.

- Simple span floor joists
- Live Load: 40 psf (L_L)
- Dead Load: 15 psf (D_L)
- Tributary width: 16 feet
- Beam span: 14 feet
- Beam depth: 11 7/8"
- α_L = Live Load Factor = 1.50
- α_D = Dead Load Factor = 1.25

$W_L = L_L$ x Tributary width = 40 psf x 16 ft = 640 plf
$W_D = D_L$ x Tributary width = 15 psf x 16 ft = 240 plf
$W_T = W_L + W_D$ = 880 plf
$W_F = \alpha_L$ x $W_L + \alpha_D$ x W_D = 1.5 x 640 plf + 1.25 x 240 plf= 1,260 plf

Check for a 3-ply beam 1 3/4"x11 7/8"

W_L = 640 plf ÷ 3 ply = 214 plf < 263 plf (by ply) ➧ ok
W_T = 880 plf ÷ 3 ply = 294 plf < 389 plf (by ply) ➧ ok
W_F = 1,260 plf ÷ 3 ply = 420 plf < 783 plf (by ply) ➧ ok

Final section: 3-ply of 1 3/4"x11 7/8"

VERSA-LAM® 2650 1.7E Column Factored Resistances

The same properties that make VERSA-LAM® beams great, also make them highly suitable for wood columns. With VERSA-LAM® columns, you'll find none of the deep checks, cracks or twists that plague solid wood columns.

VERSA-LAM® 2650 1.7E Columns

Unsupported Lenght	Factored Resistance (lb)					
(ft)	3 1/2" x 3 1/2"	3 1/2" x 5 1/4"	3 1/2" x 7"	5 1/4" x 5 1/4"	5 1/4" x 7"	7" x 7"
4.0	22,380	33,570	44,760	54,080	72,110	96,900
4.5	21,350	32,030	42,700	53,270	71,020	96,270
5.0	20,190	30,290	40,380	52,280	69,700	95,500
5.5	18,930	28,400	37,870	51,120	68,160	94,570
6.0	17,620	26,430	35,240	49,800	66,400	93,480
6.5	16,280	24,420	32,570	48,320	64,430	92,230
7.0	14,960	22,440	29,920	46,710	62,280	90,800
7.5	13,680	20,520	27,360	44,980	59,970	89,220
8.0	12,460	18,690	24,920	43,150	57,530	87,470
8.5	11,310	16,970	22,630	41,240	54,990	85,570
9.0	10,260	15,380	20,510	39,300	52,400	83,530
9.5	9,280	13,930	18,570	37,330	49,770	81,370
10.0	8,400	12,600	16,800	35,360	47,140	79,090
10.5	7,600	11,400	15,200	33,410	44,550	76,720
11.0	6,880	10,320	13,760	31,500	42,000	74,260
11.5	6,230	9,350	12,470	29,650	39,530	71,750
12.0	5,650	8,480	11,310	27,860	37,140	69,200
14.0	3,880	5,820	7,760	21,490	28,660	58,910
16.0	—	—	—	16,480	21,980	49,190
18.0	—	—	—	12,680	16,910	40,580
20.0	—	—	—	9,850	13,130	33,310

1. Table assumes that the column is braced at column ends only. Effective column length is equal to actual column length.
2. Factored Resistances loads based on one-ply column members used in dry service condition.
3. Factored Resistances are based on an eccentricity value equal to 0.167 multiplied by either the column thickness or width (worst case).
4. Factored Resistances are based on axial loaded columns using the design provisions of the CSA 086-01 (Engineering Design in Wood). For side or other combined bending and axial loads, see design provisions in CSA 086-01.
5. Values in this table are for member design only. The final design should include a complete system analysis.
6. Slenderness ratio limited to 50, as per CSA 086-01.
7. P-Δ effects are not included in analysis.

Engineered Studs for Tall Walls

VERSA-STUD® 2650 1.7E laminated veneer lumber wall framing is engineered for the high quality builder who wants…

- Stronger walls to resist wind loads
- Stiffer walls for a solid feel
- Straight walls for a high quality finish

Long, continuous VERSA-STUD® 2650 1.7E wall framing to provide superior strenght, stiffness, and appearance wall application. VERSA-STUD® 2650 1.7E wall framing provides more resistance to wind pressure than walls framed with dimension lumber and eliminates the hinge created by platform framing. 1 1/2"x 5 1/2" VERSA-STUD® 2650 1.7E wall framing has 3 times more bending strenght than No. 2 SPF 2" x 6" studs.

Available from better lumber yards in lengths up to 24 feet.

Comparison of 1 1/2" VERSA-STUD® 2650 1.7E versus Canadian Lumber Species

PRODUCT	Specified Compression Strength, f_c (psi)	Specified Bending Strength, f_b (psi)	Modulus of Elasticity, E (psi)	Specified Shear Strength, f_v (psi)
VERSA-STUD® 2650 1.7E 1 1/2" x 5 1/2"	**4,400**	**5,280**	**1,700,000**	**580**
S-P-F No.1/ No.2	1,670	1,710	1,400,000	220
S-P-F SS	2,105	2,395	1,500,000	220
Hem-Fir No.1/ No.2	2,145	1,595	1,600,000	230
Hem-Fir No. SS	2,555	2,320	1,750,000	230
D Fir-L No.1/ No.2	2,030	1,450	1,600,000	275
D Fir-L SS	2,755	2,395	1,800,000	275

Notes:
- Design values are for loads applied to narrow face of the studs (strong axis bending).
- Dimension lumber design values are taken from CSA 086-01.
- VERSA-STUD® members shall be designed using the design provisions of the CSA 086-01 (Engineering Design in Wood).
- Please contact BOISE, for additional information.

1 1/2" VERSA-STUD® 2650 1.7E Design Properties

Stud Size	Factored Bending Resistance, Mr (lb-ft)	Factored Shear Resistance, Vr (lbs)	Stiffness, EI ($x10^6$ lb.in^2)	Weight (plf)
1 1/2" x 3 1/2"	1,446	1,827	9.1	1.5
1 1/2" x 5 1/2"	3,397	2,871	35.4	2.4
1 1/2" x 7 1/4"	5,723	3,785	81.0	3.2
1 1/2" x 9 1/4"	9,068	4,829	168.2	4.0
1 1/2" x 11 1/4"	13,125	5,873	302.6	4.9

Floor Beam Span Table

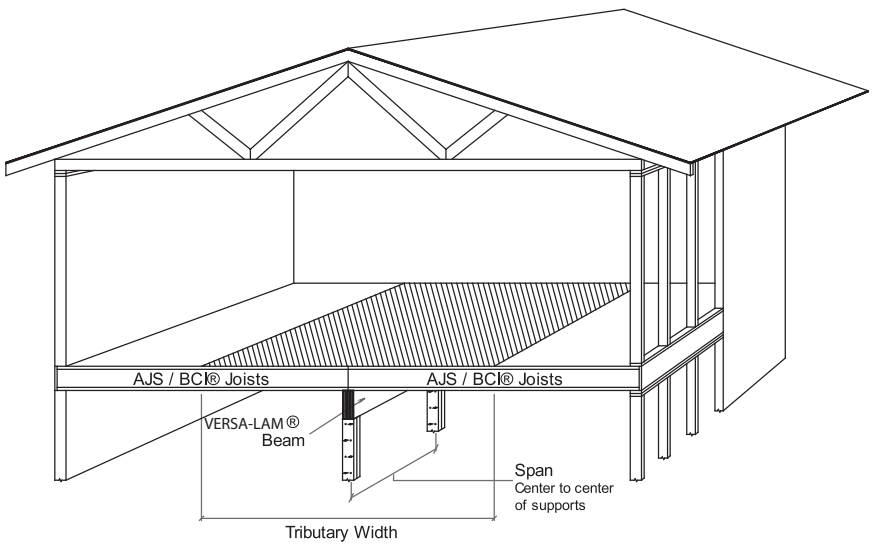
Floor Beam Span Table for VERSA-LAM® 3100 2.0E (feet)

Live Load of 40 psf Dead Load of 15 psf L / 360

Tributary Width [ft]	Beam Depth 9.5" 2 ply	9.5" 3 ply	9.5" 4 ply	11.875" 2 ply	11.875" 3 ply	11.875" 4 ply	14" 2 ply	14" 3 ply	14" 4 ply	16" 2 ply	16" 3 ply	16" 4 ply	18" 2 ply	18" 3 ply	18" 4 ply
6	14' - 6"	16' - 8"	18' - 4"	18' - 2"	20' - 10"	22' - 11"	21' - 5"	24' - 6"	27' - 0"	24' - 6"	28' - 0"	30' - 10"	27' - 7"	31' - 6"	34' - 9"
8	13' - 2"	15' - 1"	16' - 8"	16' - 6"	18' - 11"	20' - 10"	19' - 5"	22' - 3"	24' - 6"	22' - 3"	25' - 6"	28' - 0"	25' - 0"	28' - 8"	31' - 6"
10	12' - 3"	14' - 0"	15' - 5"	15' - 4"	17' - 6"	19' - 4"	18' - 1"	20' - 8"	22' - 9"	20' - 8"	23' - 8"	26' - 0"	23' - 3"	26' - 7"	29' - 3"
12	11' - 6"	13' - 2"	14' - 6"	14' - 5"	16' - 6"	18' - 2"	17' - 0"	19' - 5"	21' - 5"	19' - 5"	22' - 3"	24' - 6"	21' - 10"	25' - 0"	27' - 7"
14	10' - 11"	12' - 6"	13' - 9"	13' - 8"	15' - 8"	17' - 3"	16' - 2"	18' - 6"	20' - 4"	18' - 5"	21' - 1"	23' - 3"	20' - 9"	23' - 9"	26' - 2"
16	10' - 5"	12' - 0"	13' - 2"	13' - 1"	15' - 0"	16' - 6"	15' - 5"	17' - 8"	19' - 5"	17' - 8"	20' - 2"	22' - 3"	19' - 10"	22' - 9"	25' - 0"
18	10' - 1"	11' - 6"	12' - 8"	12' - 7"	14' - 5"	15' - 10"	14' - 10"	17' - 0"	18' - 8"	17' - 0"	19' - 5"	21' - 5"	19' - 1"	21' - 10"	24' - 1"
20	9' - 8"	11' - 1"	12' - 3"	12' - 2"	13' - 11"	15' - 4"	14' - 4"	16' - 5"	18' - 1"	16' - 4"	18' - 9"	20' - 8"	18' - 5"	21' - 1"	23' - 3"

Live Load of 40 psf Dead Load of 15 psf L / 480

Tributary Width [ft]	Beam Depth 9.5" 2 ply	9.5" 3 ply	9.5" 4 ply	11.875" 2 ply	11.875" 3 ply	11.875" 4 ply	14" 2 ply	14" 3 ply	14" 4 ply	16" 2 ply	16" 3 ply	16" 4 ply	18" 2 ply	18" 3 ply	18" 4 ply
6	13' - 2"	15' - 1"	16' - 8"	16' - 6"	18' - 11"	20' - 10"	19' - 5"	22' - 3"	24' - 6"	22' - 3"	25' - 6"	28' - 0"	25' - 0"	28' - 8"	31' - 6"
8	12' - 0"	13' - 9"	15' - 1"	15' - 0"	17' - 2"	18' - 11"	17' - 8"	20' - 3"	22' - 3"	20' - 2"	23' - 2"	25' - 6"	22' - 9"	26' - 0"	28' - 8"
10	11' - 1"	12' - 9"	14' - 0"	13' - 11"	15' - 11"	17' - 6"	16' - 5"	18' - 9"	20' - 8"	18' - 9"	21' - 6"	23' - 8"	21' - 1"	24' - 2"	26' - 7"
12	10' - 5"	12' - 0"	13' - 2"	13' - 1"	15' - 0"	16' - 6"	15' - 5"	17' - 8"	19' - 5"	17' - 8"	20' - 2"	22' - 3"	19' - 10"	22' - 9"	25' - 0"
14	9' - 11"	11' - 5"	12' - 6"	12' - 5"	14' - 3"	15' - 8"	14' - 8"	16' - 9"	18' - 6"	16' - 9"	19' - 2"	21' - 1"	18' - 10"	21' - 7"	23' - 9"
16	9' - 6"	10' - 11"	12' - 0"	11' - 11"	13' - 7"	15' - 0"	14' - 0"	16' - 1"	17' - 8"	16' - 0"	18' - 4"	20' - 2"	18' - 0"	20' - 8"	22' - 9"
18	9' - 2"	10' - 5"	11' - 6"	11' - 5"	13' - 1"	14' - 5"	13' - 6"	15' - 5"	17' - 0"	15' - 5"	17' - 8"	19' - 5"	17' - 4"	19' - 10"	21' - 10"
20	8' - 10"	10' - 1"	11' - 1"	11' - 0"	12' - 8"	13' - 11"	13' - 0"	14' - 11"	16' - 5"	14' - 10"	17' - 0"	18' - 9"	16' - 9"	19' - 2"	21' - 1"



- These tables were designed for uniform loads and for simple span floor joists. If **floor joists** are **continuous** over the VERSA-LAM® beam, multiply the tributary width by 1.25 and always select the nearest value of the higher tributary width beam.
  Example:
  If the tributary width is 14 feet, multiply by 1.25 = 17.5 feet. Select 18 feet for a new tributary width.
- Table values apply to either simple or multiple span beams. Spans are measured center to center of supports. Analyze multiple beams with the **WoodWorks Sizer® for Boise Cascade** software if the length of any span is less than half the length of an adjacent span.
- Spans are limited by a deflection equal to L/240 (Total Load)
- Check the minimum bearing lengths requirements.
- See General Notes on page 3.

Ridge Beam Span Table VERSA-LAM® 3100 2.0E (feet)

Live Load of 30 psf Dead Load of 15 psf L / 360 Roof Slope 12 / 12

Beam Depth		9.5"		11.875"		14"		16"		18"	
		2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply
House Width [ft]	16	13' - 11"	15' - 11"	17' - 5"	19' - 11"	20' - 6"	23' - 6"	23' - 5"	26' - 10"	26' - 5"	30' - 2"
	20	12' - 11"	14' - 9"	16' - 2"	18' - 6"	19' - 0"	21' - 10"	21' - 9"	24' - 11"	24' - 6"	28' - 0"
	24	12' - 2"	13' - 11"	15' - 2"	17' - 5"	17' - 11"	20' - 6"	20' - 6"	23' - 5"	23' - 1"	26' - 5"
	28	11' - 6"	13' - 2"	14' - 5"	16' - 6"	17' - 0"	19' - 6"	19' - 5"	22' - 3"	21' - 11"	25' - 1"
	32	11' - 0"	12' - 8"	13' - 10"	15' - 10"	16' - 3"	18' - 8"	18' - 7"	21' - 4"	20' - 11"	24' - 0"
	36	10' - 7"	12' - 2"	13' - 3"	15' - 2"	15' - 8"	17' - 11"	17' - 11"	20' - 6"	20' - 1"	23' - 1"
	40	10' - 3"	11' - 9"	12' - 10"	14' - 8"	15' - 1"	17' - 3"	17' - 3"	19' - 9"	19' - 5"	22' - 3"

Live Load of 40 psf Dead Load of 15 psf L / 360 Roof Slope 12 / 12

Beam Depth		9.5"		11.875"		14"		16"		18"	
		2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply
House Width [ft]	16	13' - 1"	15' - 0"	16' - 5"	18' - 9"	19' - 4"	22' - 2"	22' - 1"	25' - 4"	24' - 10"	28' - 6"
	20	12' - 2"	13' - 11"	15' - 2"	17' - 5"	17' - 11"	20' - 6"	20' - 6"	23' - 6"	23' - 1"	26' - 5"
	24	11' - 5"	13' - 1"	14' - 4"	16' - 5"	16' - 10"	19' - 4"	19' - 4"	22' - 1"	21' - 9"	24' - 10"
	28	10' - 10"	12' - 5"	13' - 7"	15' - 7"	16' - 0"	18' - 4"	18' - 4"	21' - 0"	20' - 7"	23' - 7"
	32	10' - 5"	11' - 11"	13' - 0"	14' - 11"	15' - 4"	17' - 7"	17' - 6"	20' - 1"	19' - 9"	22' - 7"
	36	10' - 0"	11' - 5"	12' - 6"	14' - 4"	14' - 9"	16' - 10"	16' - 10"	19' - 4"	18' - 11"	21' - 9"
	40	9' - 8"	11' - 0"	12' - 1"	13' - 10"	14' - 3"	16' - 3"	16' - 3"	18' - 8"	18' - 4"	21' - 0"

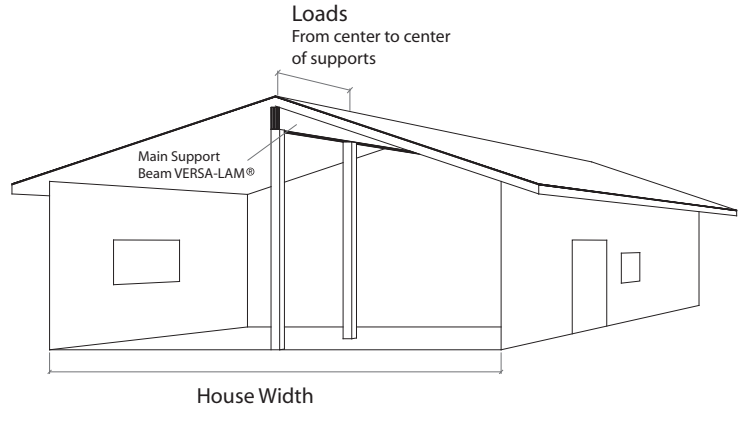
Live Load of 50 psf Dead Load of 15 psf L / 360 Roof Slope 12 / 12

Beam Depth		9.5"		11.875"		14"		16"		18"	
		2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply
House Width [ft]	16	12' - 3"	14' - 0"	15' - 4"	17' - 6"	18' - 1"	20' - 8"	20' - 8"	23' - 8"	23' - 3"	26' - 7"
	20	11' - 4"	13' - 0"	14' - 2"	16' - 3"	16' - 9"	19' - 2"	19' - 2"	21' - 11"	21' - 7"	24' - 8"
	24	10' - 8"	12' - 3"	13' - 4"	15' - 4"	15' - 9"	18' - 1"	18' - 0"	20' - 8"	20' - 3"	23' - 3"
	28	10' - 2"	11' - 7"	12' - 8"	14' - 6"	15' - 0"	17' - 2"	17' - 1"	19' - 7"	19' - 3"	22' - 1"
	32	9' - 8"	11' - 1"	12' - 2"	13' - 11"	14' - 4"	16' - 5"	16' - 4"	18' - 9"	18' - 5"	21' - 1"
	36	9' - 4"	10' - 8"	11' - 8"	13' - 4"	13' - 9"	15' - 9"	15' - 9"	18' - 0"	17' - 9"	20' - 3"
	40	9' - 0"	10' - 4"	11' - 3"	12' - 11"	13' - 4"	15' - 3"	15' - 2"	17' - 5"	17' - 1"	19' - 7"

Live Load of 60 psf Dead Load of 15 psf L / 360 Roof Slope 12 / 12

Beam Depth		9.5"		11.875"		14"		16"		18"	
		2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply	2 ply	3 ply
House Width [ft]	16	11' - 6"	13' - 2"	14' - 5"	16' - 6"	17' - 0"	19' - 5"	19' - 5"	22' - 3"	21' - 10"	25' - 0"
	20	10' - 8"	12' - 3"	13' - 4"	15' - 4"	15' - 9"	18' - 1"	18' - 0"	20' - 8"	20' - 3"	23' - 3"
	24	10' - 1"	11' - 6"	12' - 7"	14' - 5"	14' - 10"	17' - 0"	17' - 0"	19' - 5"	19' - 1"	21' - 10"
	28	9' - 7"	10' - 11"	11' - 11"	13' - 8"	14' - 1"	16' - 2"	16' - 1"	18' - 5"	18' - 2"	20' - 9"
	32	9' - 2"	10' - 5"	11' - 5"	13' - 1"	13' - 6"	15' - 5"	15' - 5"	17' - 8"	17' - 4"	19' - 10"
	36	8' - 9"	10' - 1"	11' - 0"	12' - 7"	12' - 11"	14' - 10"	14' - 10"	17' - 0"	16' - 8"	19' - 1"
	40	8' - 6"	9' - 8"	10' - 7"	12' - 2"	12' - 6"	14' - 4"	14' - 4"	16' - 4"	16' - 1"	18' - 5"

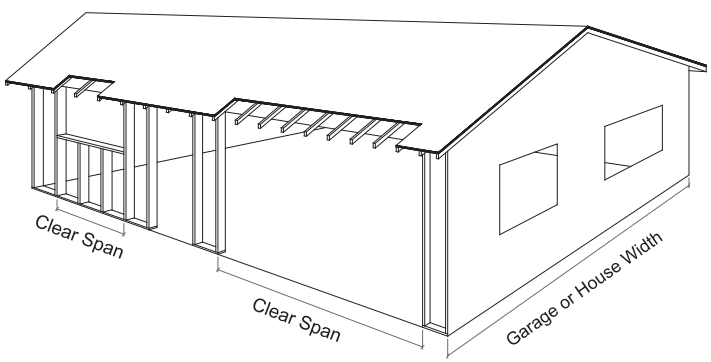
- This table assumes a maximum roof slope of 12 / 12.
- This table has been established using a Live Load deflection equal to L / 360 and a Total Load deflection limit equal to L / 240 .
- This table assumes uniform loads and simple span roof joists.
- Table values represent the most restrictive of simple or continuous span beam applications. Span is measured center to center of the supports. Analyze continuous span beams with the WoodWorks Sizer for Boise Cascade software if the length of any span is less than half the length of an adjacent span.
- Table values assume that lateral support is provided at each support and continuously along the compression edge of the beam.



Garage & House Header Table

Garage & House Headers Span for VERSA-LAM® 3100 2.0E

Load (psf)		30 pdf Live Load + 15 psf Dead Load (Unfactored)							40 psf Live Load + 15 psf Dead Load (Unfactored)					
Header Span		Deflection	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft
Garage or House Widith (ft)	16	L/360	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"
		L/480	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14" —
	18	L/360	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"
		L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"
	20	L/360	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"
		L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875'	3.5" x 5.5" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"
	22	L/360	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"
		L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"
	24	L/360	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14"
		L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"
	26	L/360	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"
		L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"
	28	L/360	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"
		L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"
	30	L/360	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"
		L/480	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
	32	L/360	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"
		L/480	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
	34	L/360	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"
		L/480	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
	36	L/360	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"
		L/480	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"



- Table values are for Simple span headers only. Span is measured center to center of the supports. Analyze continuous span headers with the WoodWorks Sizer for Boise Cascade software.
- Minimum bearing requirements is 3.5" at both ends.
- This table assumes a 24" soffit and a maximum slope of 6/12.
- This table assumes uniform loads and simple truss span.
- Table values assume that lateral support is provided at each support and continuously along the compression edge of the beam.
- 3 1/2" = 2-plys of 1 3/4".
  5 1/4" = 3-plys of 1 3/4".
- For headers unsupported laterally by trusses, use beam size out of brackets (thicker and shallower dimensions).

Garage & House Header Table

50 psf Live Load + 15 psf Dead Load (Unfactored)						60 psf Live Load + 15 psf Dead Load (Unfactored)					
6 ft	8 ft	10 ft	12 ft	14 ft	16 ft	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft
3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"
3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"
3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"
3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"
3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
3.5" x 5.5" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"
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3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"
3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11.25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"
3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 16" 5.25" x 14"	— 5.25" x 16"
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3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"	3.5" x 7.25" —	3.5" x 9.5" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" —	3.5" x 18" 5.25" x 16"	— 5.25" x 18"
3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 14" 5.25" x 11,25"	3.5" x 16" 5.25" x 14"	3.5" x 18" 5.25" x 16"	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.875"	3.5" x 16" 5.25" x 14"	**3.5" x 18"** 5.25" x 16"
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= 4" bearing

= 4 1/2" bearing

Load (psf)		30 psf Live Load + 15 psf Dead Load (Unfactored)					
Header Span	Deflection	6 ft	8 ft	10 ft	12 ft	14 ft	16 ft
Garage or House Width (ft) 20	L/360	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.5"	3.5" x 14" 5.25" x 11.25"
	L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" 5.25" x 7.25"	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.875" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"
22	L/360	3.5" x 5.5" —	3.5" x 7.25" 5.25" x 5.5"	3.5" x 9.25" 5.25" x 7.25"	3.5" x 9.5" 3.25" x 9.25"	3.5" x 11.25" —	3.5" x 14" 5.25" x 11.25"
	L/480	3.5" x 5.5" —	3.5" x 7.25" —	3.5" x 9.25" —	3.5" x 11.25" 5.25" x 9.25"	3.5" x 11.25" 5.25" x 11.25"	3.5" x 14" 5.25" x 11.875"

''L/360'' = Deflection criteria is L/360 (live load) and L/240 (total load)

'L/480'' = Deflection criteria is L/480 (live load)

2 possible choices for headers supported laterally by trusses → 3.5" x 9.5" 3.25" x 9.25"

1 possible choice for headers unsupported laterally by trusses → 3.25" x 9.25"

Bearing Lengths Requirements

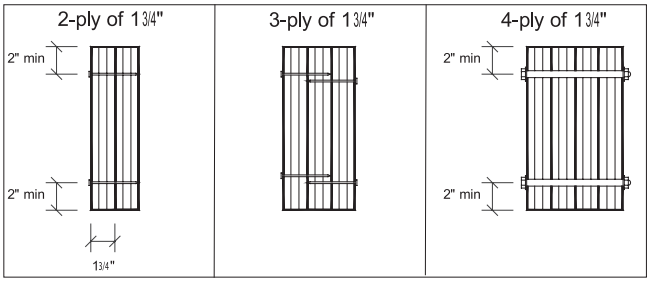
Factored Reaction (lbs)	Minimum Bearing Length per bearing width (inches)			
	1-3/4"	3-1/2"	5-1/4"	7"
2,000	1 1/2	1 1/2	1 1/2	1 1/2
4,000	2	1 1/2	1 1/2	1 1/2
6,000	3	1 1/2	1 1/2	1 1/2
8,000	3 3/4	2	1 1/2	1 1/2
10,000	4 3/4	2 1/2	1 3/4	1 1/2
12,000	5 3/4	3	2	1 1/2
14,000	6 3/4	3 1/2	2 1/4	1 3/4
16,000	7 1/2	3 3/4	2 1/2	2
18,000	--	4 1/4	3	2 1/4
20,000	--	4 3/4	3 1/4	2 1/2
22,000	--	5 1/4	3 1/2	2 3/4
24,000	--	5 3/4	3 3/4	3
26,000	--	6 1/4	4 1/4	3 1/4
28,000	--	6 3/4	4 1/2	3 1/2
30,000	--	7 1/4	4 3/4	3 3/4
32,000	--	7 1/2	5	3 3/4
34,000	--	--	5 1/2	4
36,000	--	--	5 3/4	4 1/4
38,000	--	--	6	4 1/2
40,000	--	--	6 1/4	4 3/4

- The Factored Bearing Resistance is calculated in accordance with CSA O86-01 "Engineering Design in Wood ".
- Clause 9.23.8.1 (NBCC), prescribes a minimum bearing length requirement of at least 3 1/2", for BEAMS in simple spans.
- Clause 9.23.8.1 (NBCC), prescribes a minimum bearing length requirement of least 3 1/2" , for JOISTS in simple spans.
- A minimum bearing length of 3 1/2" (joist) and 7 1/2" (beam) is recommended at intermediate bearing supports.
- Bearing lengths are based on a Factored Bearing Resistance, Qr = 1220 psi.
- The full bearing width is required

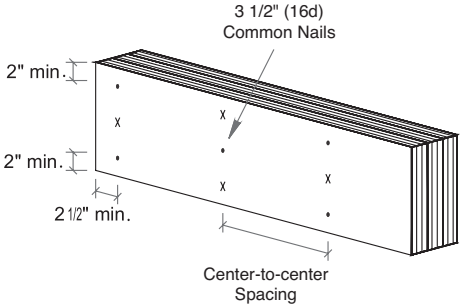
VERSA-LAM® 3100 2.0E Multiple Beam Connections

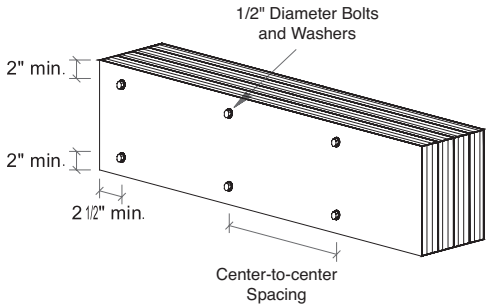
Maximum Factored Uniform Load applied to OUTER PLY (plf)

Number of 1 3/4" Plies	Nailed Connection		Bolted Connection		
	2 rows of 3 1/2" (16d) common nails	3 rows of de 3 1/2" (16d) common nails	2 rows of 1/2" dia. Bolts (ASTM A307)		
	12" o.c	12" o.c	6" o.c	12" o.c	24" o.c
2	915	1,375	2,715	1,355	675
3	685	1,030	2,035	1,015	505
4	Use bolt schedule		1,810	905	450

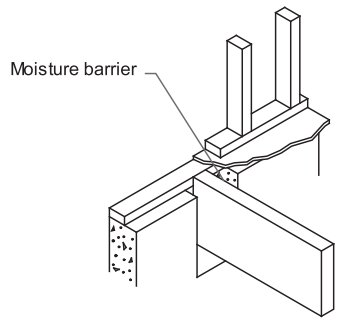


1. Design values apply to common bolts that conform to ASTM A307. A washer not less than a standard cut washer shall be between the wood and the bolt head and between the wood and the nut. The distance from the edge of the beam to the bolt holes must be at least 2" for 1/2" bolts.
2. The nail schedules shown apply to both sides of a three member beam.
3. 4-ply beams must be top-loaded or loaded from both sides.
4. Bolt holes shall not be greater than 1/16 of the bolt diameter.
5. An equivalent specific gravity of 0.5 may be used when designing specific connections with VERSA-LAM®.
6. Beams wider than 7" must be designed by the professional engineer of record.
7. Connection design is based on CSA O86-01
8. FastenMaster TrussLok, Simpson Strong-Tie SDS, and USP WS screws may also be used to connect multiple member VERSA-LAM® beams, contact Boise EWP Engineering for further information.



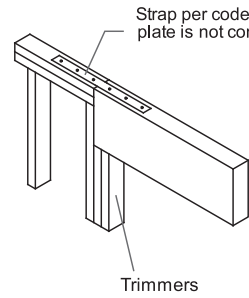


Bearing at Exterior Wall



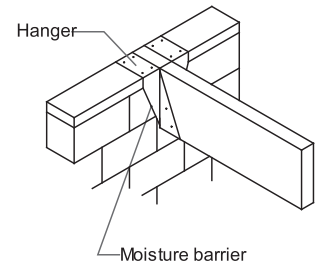
Minimum of 1/2" Air Space Between Member and Wall Pocket or Adequate Moisture Barrier Must be Provided.

Bearing for Door or Window Header

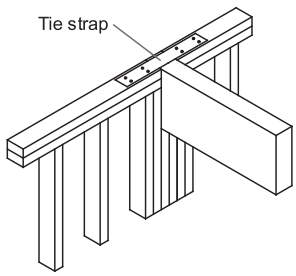


Beam to Masonry (or Concrete) Wall

Wood top plate must be flush with inside of wall

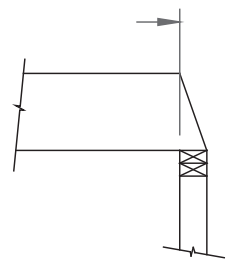


Beam Framing Into Wall

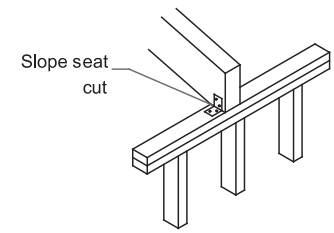


Bevel Cut

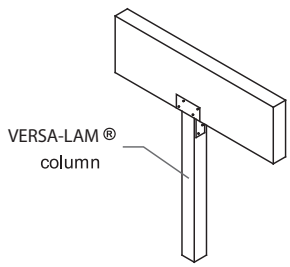
Do Not bevel cut beyond inside face of wall without approval from Boise Engineering.



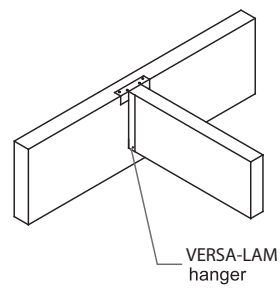
Slope Seat Cut



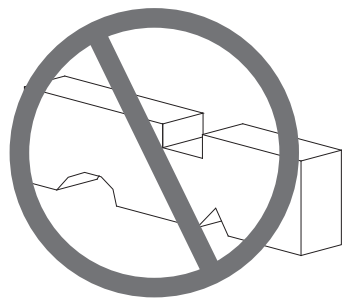
Bearing at Column



Beam to Beam Connection



DO NOT DRILL, NOTCH, CUT OR ALTER VERSA-LAM® BEAMS



Lifetime Guaranteed Quality and Performance

Boise fully warrants its VERSA-LAM® products to comply with our specifications, to be free from defects in material and workmanship, and to meet or exceed our performance specifications for the normal and expected life of the structure when correctly stored, installed and used according to our Installation Guide.

In keeping with its on-going product development policy, BOISE Engineered Wood Products Ltd periodically revises its literature. Contact your distributor to verify that this is an updated version.

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Printed in Canada. June 2007

www.bc.com

Distributor:

VLCDNSG 07/2002